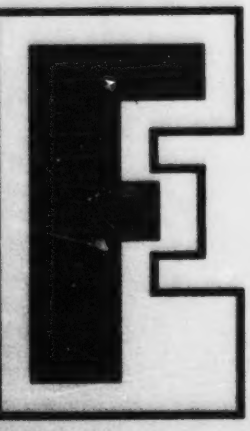

Economics & Forecasts Division
Power System Program Branch

ALTERNATIVE SCENARIOS FOR CORPORATE PLANNING

SEPTEMBER 1988

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This review replaces the September 1987 Alternative Scenarios.

Economics and Forecasts Division

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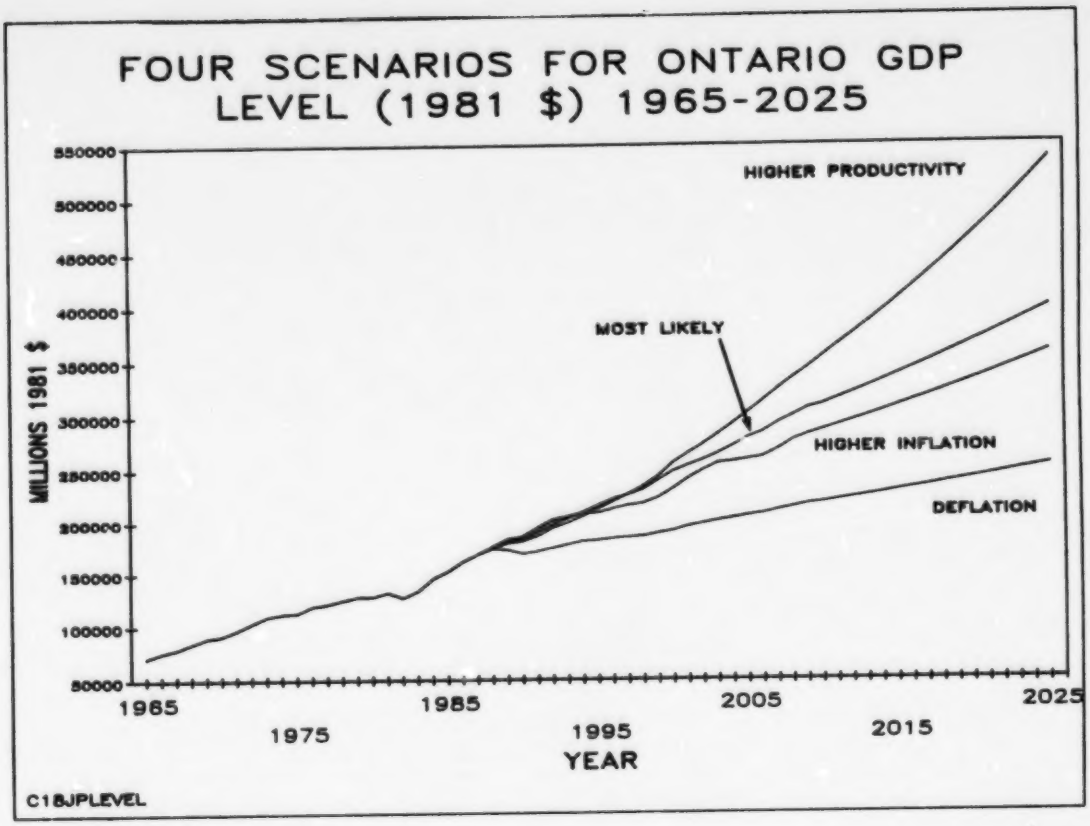
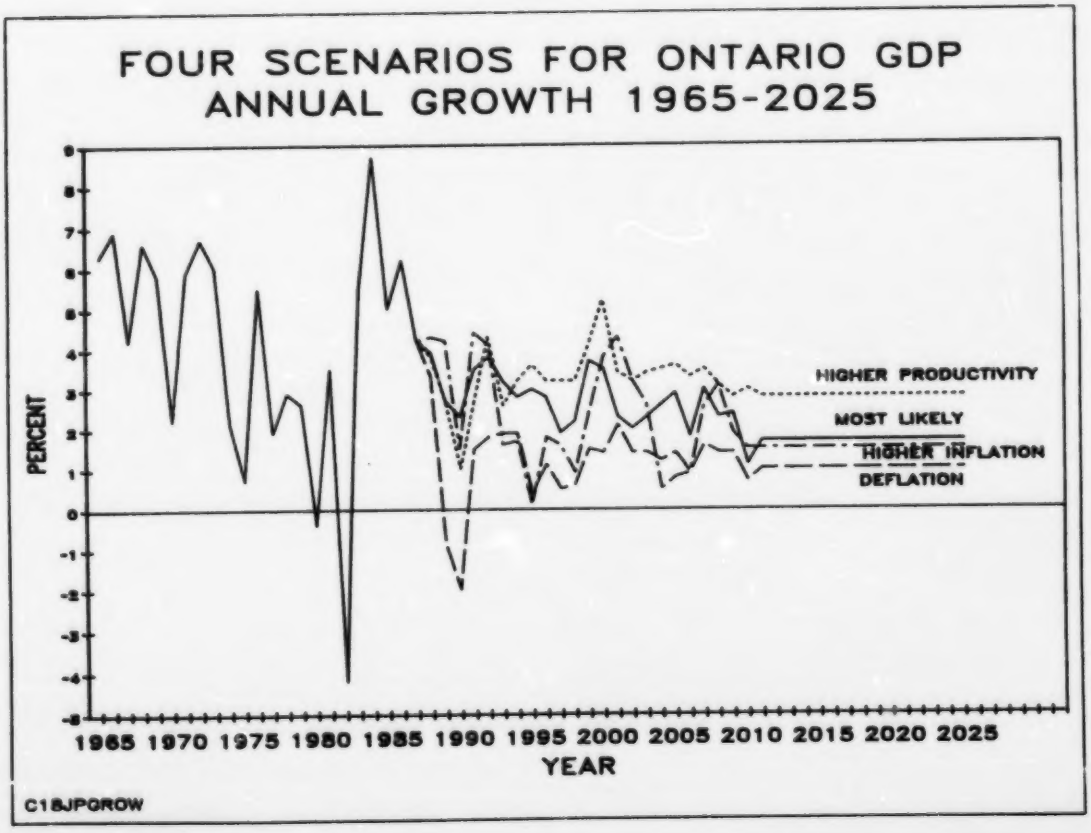

FOUR SCENARIOS FOR ONTARIO GDP
LEVEL (1981 $) 1965-2025
MILLIONS 1981 $
550000
500000
450000
400000
350000
300000
250000
200000
150000
100000
50000
HIGHER PRODUCTIVITY
MOST LIKELY
HIGHER INFLATION
DEFLATION
1965
1975
1985
1995
2005
2015
2025
YEAR
C18JPLEVEL


FOUR SCENARIOS FOR ONTARIO GDP
ANNUAL GROWTH 1965-2025
PERCENT
HIGHER PRODUCTIVITY
MOST LIKELY
HIGHER INFLATION
DEFLATION
1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025
YEAR
C18JPGROW

Note to Users: The Economics and Forecasts Division provides two types of uncertainty measures. The alternative scenarios, described in this report, are to be used in instances where you have a planning model which relies on the interaction of a consistent set of economic variables over time. The other type of uncertainty measure, described in the "Prediction Ranges" report, consists of specific values related to a statistical probability distribution. The latter should be used when your plan depends on the outcome of a key economic variable at a specific point in time, and you want to be able to specify the probability range of the outcomes of your planning goal.

1.0 INTRODUCTION

The Importance of Economic Scenario Forecasts for Long-Term Planning

Economic theories are generalizations about group behaviour. Even if these theories were perfect, there would be a great deal of uncertainty associated with economic predictions, because the economy is often affected by the random decisions of individual human beings (particularly those in positions of political power). All economic forecasts are conditional on a variety of uncertain political and technological events whose determination is outside the scope of economic models. To draw an analogy from the physical sciences, a physicist who has a thorough knowledge of the laws of gravity and aerodynamics will not always be able to predict exactly where a piece of paper dropped from a desk will land.

The possible wide divergences in economic performance are particularly problematic for generation capacity planning in an electric utility, since this planning must be done over a very long time horizon and therefore must rely on forecasts of a very distant future. Rational planning requires the incorporation of all available knowledge in our forecasts of the future. That knowledge must include such information as we have or can generate relating to the uncertainty itself.

Taking into account these uncertainties leads to conditional forecasts in the form of multiple scenarios. Scenarios, as a set of forecasts, allow the user to benefit from the economist's in-depth knowledge of the nature and magnitude of uncertainty about the future. A manager who receives unitary forecasts is not taking full advantage of the knowledge which his or her economists possess.

Since the scenarios indicate a wide range of possible outcomes, a system planner could complain that they give no information about the future. But they do provide information in several ways. They tell the planner what conditions are likely to produce the various futures. They also indicate that some outcomes are more likely than others. By giving the planners a sense of the variety of possible outcomes, the scenarios can stimulate ideas about how to develop plans which may be more flexible and better able to succeed in a variety of economic environments.

The proper use of scenarios requires a high degree of interaction between the economist and the client, for two reasons. A myriad of elements create uncertainty, and only a few of them can be covered in a general set of scenarios. Therefore, the forecaster must be thoroughly familiar with the client's problem in order to make sure he has included the full subset of factors which are relevant to it. Users whose plans depend heavily on some indicator other than GDP growth or inflation are invited to call the Economics and Forecasts Division (7553 or 6389) in advance for an opinion on how the scenarios should be used. Where it is felt to be necessary, we can provide modifications to the main scenarios.

Second, a greater knowledge is required by the decision maker about the sources of economic uncertainty and the direction in which they may cause events to turn. The ultimate decision on a plan usually cannot be purely objective, given the degree of uncertainty which exists. The person who has the authority to make the decision inevitably must make an intuitive judgment about what weight to give each economic scenario. For this to be a good judgment, the manager must become familiar with the main elements of the economic reasoning used in constructing the scenarios.

2.0 CLASSIFICATION OF USES OF SCENARIOS

Five classes of uses of scenarios can be distinguished. These are arranged in order of increasing formality of use:

2.1 Cautionary

Here, the scenarios are used to give management a sense of the degree of uncertainty, and the potential range of variation. Management may intuitively apply this knowledge, by making sure that corporate plans have the flexibility to cope with contingencies which may arise. This may be done by the manager asking himself what course of action is best under each scenario, and introducing some features of several of the alternatives into his final plan.

2.2 Strategic Preparation

If managers are warned of possible alternatives in advance, they will have a chance to develop strategies to deal with them, and will be able to respond faster if the alternative scenario occurs.

2.3 Menu of Forecasts

The economist presents several scenarios to management, explaining the assumptions which would cause each one to come about. The key uncertainties may be political or technological, and senior management may be more qualified to make predictions about these than the economist. Therefore, based on this expertise, the senior manager picks the economic scenario which appears most plausible to him, and this becomes the basis for the corporate plan. Where one main scenario is chosen, the other scenarios may be used as a check on the validity of the resulting strategy.

2.4 Financial Simulations

The scenarios are used as assumptions to project sales and financial results from plans already committed. Management thus has a sense of the likely range

of future outcomes for the corporation, enabling them to think ahead of time about how they will need to respond. Customers can be given some indication of the potential range of the future prices they may face.

2.5 Formal Risk Management

This use of scenarios usually presupposes a formal model for predicting the corporation's sales, profits, etc. in response to different economic assumptions. The results of a number of possible corporate plans would be checked against the set of economic scenarios. For a global corporate plan, the objective may be to find the "minimax" strategy: the one which produces the minimum loss under all scenarios. Corporate plans may need to be redesigned to find one which is viable under a wide range of economic backgrounds. Where a specific contract or project is being evaluated, the scenarios may suggest modifications. In some instances, the conclusion will be that no modification can reduce the risk to an acceptable level, and therefore the contract or project proposal will be dropped.

3.0 A DESCRIPTION OF THE SCENARIOS

Four scenarios have been constructed. Each scenario represents a separate chain of events. The values of the different variables within a scenario are consistent with each other. Therefore, in performing simulations, a user of these forecasts should be careful to take all the economic variables for each simulation from the same scenario. The values shown for a variable (eg, the Consumer Price Index) in a particular year in the different scenarios are not meant to represent the potential range of that variable, but rather its most likely value given the assumptions underlying each scenario. It should be noted that the names of the scenarios refer to general characteristics, which may not be evident in every year of the forecast. For example, in some individual years the "Higher Productivity" scenario has lower real GDP growth than the "Most Likely" scenario, even though in general it has higher growth.

Each scenario tells a story about economic outcomes over a 40 year long span of time. Each one assumes that essentially the same characteristics will continue over the whole span (eg, low growth or high growth, low inflation or high inflation) of the scenario. In each case, there is some rationale for why such an unbroken constancy of the state of the world would persist for so long. However, it must also be recognized that, after the economy has been in one scenario for a number of years, fundamental factors could be changed to move it into another.

Users have frequently asked us for guideposts which would help them recognize which of the scenarios the world is following at any point in time. It is not always possible to identify this based on any individual economic indicator, because even within a scenario there is quite a wide range of values possible around the central tendency which is shown in our forecast numbers. However, two key items stand out as signposts for the current scenarios. A successful implementation of the free trade agreement between Canada and the United States would tend to point us toward the Higher Productivity scenario. By contrast, a series of major bank failures (triggered by third world debt problems) would tend to point toward the Deflation scenario.

3.1 Higher Productivity Scenario

This scenario combines relatively high real GDP growth with relatively low inflation. The term "productivity" refers to the amount of real output which results per unit of factor of production. For example, this could be measured by the dollar value of real GDP produced by the average worker in a year. As economists, we feel that we could prescribe some modifications in government policy which would bring about higher productivity growth. However, as forecasters, we are not so optimistic that we think the government will actually follow this preferred policy path, and therefore this scenario is not the most likely. **It should also be noted that, while productivity in this scenario is relatively high by historic standards, the overall real GDP growth rate is relatively low. This reflects the much slower growth in the labour force, due to the tremendous drop in birth rates during the past two decades. This scenario assumes a growing birth rate and a higher rate of immigration than the Most Likely scenario, but it still leaves the population growth rate below the historical average.**

The economic situation described in the Higher Productivity scenario is far from utopian, and in fact it is quite similar to the performance the economy achieved in the twenty year period ending around 1970. However, toward the end of the 1960s, government fiscal and monetary management of the economy deteriorated rapidly, and it has yet to return to anywhere close to the condition it was in up to the mid-1960s. The ongoing severe debt and deficit problems are clear evidence of this. However, there has at least been a recognition of the need to bring about an improvement, and monetary policy has become more restrained since 1979, thereby significantly lowering the inflation rate. It is expected that both the US and Canadian monetary authorities will follow responsible monetary policies, which will help maintain relatively low inflation and interest rates.

Major advances in technology, such as electronics, communications and bio-engineering are expected to culminate in relatively higher rates of productivity growth provided the economic environment becomes favourable for new investment needed to exploit these new technologies. Much of the new technology has

not yet been applied in production processes, and creates a great potential for productivity growth. One of the factors hindering the application of new technology has been the high and unstable pattern of interest rates, which is related to government fiscal mismanagement. The Higher Productivity scenario assumes that further progress will be made on the government policy front to alleviate this situation, with the US government deficit being eliminated by 1992. (The needed tax increases and government spending cuts could temporarily lead to slower economic growth in the late 1980s, but would produce higher long-run growth.)

In order to benefit fully from these technological advances, Canadian manufacturing would need access to larger scale markets. The average Canadian manufacturing employee produces 20% less than his US counterpart, and this has been attributed mainly to the small scale of production runs in Canadian plants. The Free Trade Agreement which has now become law in the United States, is also assumed to be adopted in Canada. It is expected that free trade would benefit the manufacturing sector of the Ontario economy by permitting a more efficient scale of operations, and therefore higher productivity growth.

The better growth in this scenario will not start until the 1990s. The industrial restructuring needed for closer trade integration with the United States will probably extend over a whole decade. In the first few years, the transition costs may in fact cause lower growth. The effect on the Canadian dollar is more rapid and there has already been a substantial appreciation in 1988 in anticipation of the FTA. The Free Trade Agreement will make Canada a safer place to invest, and will probably bring significant quantities of foreign capital to Canada.

The industrial structure emerging from this scenario would likely be considerably different from the present one. An increasingly small proportion of the labour force will be employed directly in goods production, which is bound to become increasingly automated. A greater proportion of value-added will be at the stage of process design. While production would be more automated, it would not necessarily be much more capital intensive. In order to achieve

growing standards of living, it will be necessary for technical innovation to be directed at increasing the productivity of all factors of production, including capital and energy.

We are raising the probability assigned to the Higher Productivity scenario, as a result of the successful adoption of the Free Trade Agreement as law in the United States to 30 percent. This is a more limited form of free trade than many had anticipated. (For example, it retains agricultural marketing boards. Our Most Likely scenario already incorporated some elements of freer trade in the long term.) In addition to the obstacles which remain for freer trade, it should be remembered that this scenario also depends on overall better economic management, particularly in the area of government deficit reduction, and progress in that area remains slow.

3.2 Most Likely Scenario

This scenario is described at length in the "Long-Term Economic Outlook" report. In contrast to the Higher Productivity scenario, it assumes that governments will follow a slightly restrictive monetary policy which will result in a small rebound in inflation in the long run (as compared to the declining inflation rate in the Higher Productivity scenario). Productivity growth is assumed to be near the Ontario post-war average rate of 1.7% per year. However, real GNP growth is expected to be low by historical standards because of the slow growth of the labour force resulting from a low birth rate and low rates of immigration.

3.3 Deflation Scenario

This scenario couples low inflation with low real GDP growth. The continuing problems with the US trade deficit culminate in increased protectionism in the United States against all of its trading partners. The United States economy at the present time is living well beyond its means, and the strains created by this situation, combined with previous unresolved problems, could plunge the world into a serious depression. The current large balance of payments deficit (near $125 billion) of the United States is in large part due to its federal

government deficit. These twin deficits are being financed by a continuing massive volume of foreign borrowing by the United States. However, if this flow of capital falters, real interest rates in North America would rise dramatically.

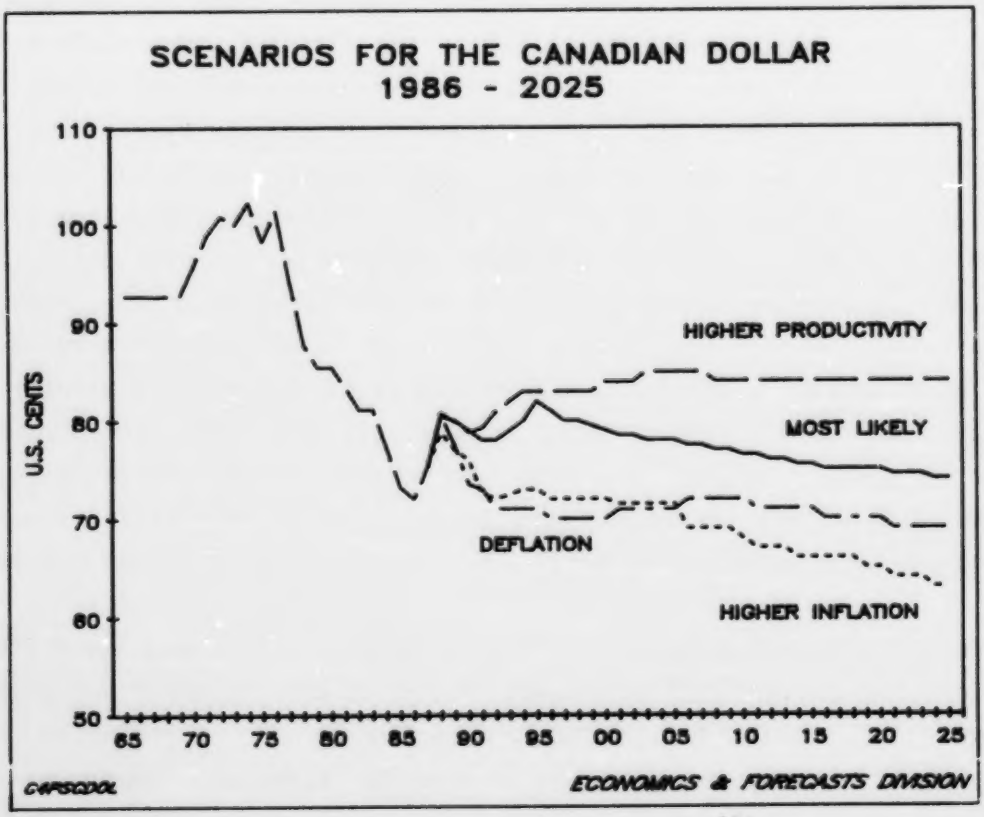
The result of increased protectionism and higher real interest rates will be a global recession, which will lead to problems for the LDCs. In this kind of global environment, the LDCs will not be able to repay their loans and this is bound to threaten the solvency of the commercial banks in many industrial countries. If the lost liquidity were not quickly replaced through central bank intervention, the recession would quickly escalate into a depression. Given the stringent attitudes of many central bankers today, this type of policy mistake is a possibility in such a situation.

The Canadian economy, as always, would be particularly sensitive to such a world downturn, since close to half of our exports consist of the types of basic commodities which would be subject to the fiercest competition and the lowest prices. In Ontario we depend more on manufacturing exports, and these would be at risk if trade relations with the United States deteriorate. The last few years have been good for Ontario's auto industry, as sales have boomed to make up for the low rate of replacement of cars in the years from 1979 to 1983, when interest rates were very high. As a result of high profits, the auto makers have been investing heavily in additions to their production capacity. Also, foreign auto makers are building plants here as a bargaining chip to gain access to the North American markets. Experts are warning that car sales are headed for a cyclical decline just when these new plants are going to be ready. The implication is that we will not only be producing few cars, but also we will be without new construction of facilities (itself an important economic activity) for quite a few years beginning in the late 1980s.

When we couple a severe downturn in the auto industry with a weak world economy and the continuing oversupply of commodities, it is easy to envision a significant depression for the Ontario economy, extending over a period of a few years. Ultimately, governments would try to stimulate demand by more expansionary money supply policies. However, once a depressionary psychology

has developed, it takes quite a while for such measures to succeed in generating demand growth.

The longer-term outlook following out of this depressed medium term view is also fairly gloomy. Depressed conditions are not conducive to technological development or the kind of industrial restructuring which is needed to stay ahead in an increasingly competitive world economy. The low-wage developing countries would likely be closing the gap between us and them, since they can get ahead just by exploiting the technology which already exists. The Canadian government would probably respond by imposing new restrictions on imports. This would temporarily ease the crisis, but it would do nothing to pull the economy out of the low productivity growth situation in which it would be mired in this scenario.



3.4 Higher Inflation Scenario

The western world has effectively reduced inflation from the high rates witnessed in the 1970s. It is hoped that the lesson about the damaging effects of inflation has been learned, and will act as a constraint on future government policies. However, quite a few arguments support a more pessimistic view.

The biggest single danger stems from the contention that inflationary policies initially have desirable short-term effects of stimulating economic growth albeit the consequences of inflation manifest themselves much later. These benefits represent a strong temptation to politicians who face a relatively short electoral cycle.

In fact, it would be relatively easy to blunder into high inflation again, despite the best intentions. Although there is a clear consensus that stringent monetarist policies (limiting the growth of the money supply) starting in 1979 were responsible for putting an end to high inflation rates in North America, there is disagreement about how monetary policy should be conducted in the future. Those in control in the United States are following a policy of trying to revive economic growth, without any attention to the money supply. The monetarists are alarmed by this. A good example is this view expressed in the August 1986 review of the Swiss Bank Corporation: "The danger is real at present. Too many central banks and governments have seized on the present low inflation figures (which have in fact been driven down by external factors) to dismiss inflation as a dead issue and have ceased to worry about money supply growth overshooting its target. Persisting in this behaviour will sow the seeds of future inflation."

Events which have occurred since last year have allayed our concerns about the risks to some extent. The inflationary spike witnessed in 1987 has relented and inflationary pressures from an overheated economy have not as yet manifested themselves. Central bankers who were relatively unconcerned about inflation a year ago are now paying serious attention to it. This is particularly the case in Canada, where the Bank of Canada Governor, John Crow, has openly expressed his unhappiness about the inflation rate being as high as 4.5

percent, and has maintained a relatively tight monetary policy despite a strong Canadian dollar. However, it is not clear whether the Bank of Canada Governor will resist pressure from the government to loosen monetary policy if the economy falters. In the United States, Mr. Greenspan has been pursuing an anti-inflation policy, thereby continuing the tradition started by Paul Volcker in the late 1970s. However, as Mr. Greenspan is near the retirement age and this could be used as an excuse to replace him with a more liberal individual in 1991, particularly if a Democrat becomes president.

At present, the greatest threat of a renewal of inflation stems from the instability in foreign exchange markets resulting from the huge US trade deficit. The ideal response to this problem would be an increase in taxation or a reduction in government expenditure, to reduce the total spending of individuals to an amount closer in line to what they produce. Failing that, real interest rates will need to be increased in order to keep foreigners lending enough to the United States to finance the trade deficit. If this is not done, the United States dollar will resume on a long-term downward trend with further inflationary consequences.

The LDC debt crisis, poses a potential danger for a new round of inflation. If the world economy falls into a recession, the LDCs may not be able to make their loan payments. This will precipitate a banking crisis in the United States. Domestic problems with the savings and loans institutions in the United States are also serious and if too many of these institutions become insolvent, the US Fed may be forced to bail them out. This will have inflation consequences.

High inflation initiated in the United States, will quickly feed through to Canada. The experience of the 1973-82 period illustrates that once high inflation is entrenched, it requires extraordinary measures to eliminate it. This scenario assumes that the political will of the type shown in the 1979-82 period will be lacking, and inflation will essentially be a fact of life.

The resulting instability in this environment will result in lower average real GDP growth rates for a number of reasons. Continuing attempts by governments

to halt the inflation would produce recurrent recessions. It is assumed that the efforts will be half-hearted and would not permanently reduce inflation. The volatility of this environment would make it difficult planning and capital formation would be impaired. The result will be lower productivity growth. Uncertainty in the future course of inflation will lead to an increase in the risk and hence will imply higher real interest rates.

This scenario is quite pessimistic for the economy as a whole, but at least in the medium term it is probably the best for Ontario Hydro, because it is the only one that includes ongoing high inflation. Interest rates on new borrowing would be high, but the continuing high inflation would ease the relative burden of the high fixed charges on obligations already acquired in the past. The other scenarios assume declining inflation, and therefore the funds borrowed in recent years, at interest rates of 12% to 17%, would represent very high realized real interest rates.

4.0 ALTERNATIVE SCENARIOS - ENERGY

REAL INTERNATIONAL AND DOMESTIC ENERGY PRICES ($1988)
ALTERNATIVE SCENARIOS

	HIGHER PRODUCTIVITY			MOST LIKELY			HIGHER INFLATION			DEFLATION		
	Oil Int'l US$/bbl	Oil Domestic Cdn$/bbl	Natural Gas Cdn$/Mcf	Oil Int'l US$/bbl	Oil Domestic Cdn$/bbl	Natural Gas Cdn$/Mcf	Oil Int'l US$/bbl	Oil Domestic Cdn$/bbl	Natural Gas Cdn$/Mcf	Oil Int'l US$/bbl	Oil Domestic Cdn$/bbl	Natural Gas Cdn$/Mcf
1987	17.90	25.30	3.90	17.90	25.30	3.90	17.90	25.30	3.90	17.90	25.30	3.90
1990	18.10	25.30	4.00	17.10	23.90	3.50	15.80	23.30	3.50	12.80	19.40	3.20
2000	31.70	40.80	6.30	23.60	31.50	4.90	15.00	20.80	3.10	15.70	22.50	3.50
2010	38.00	48.00	7.50	26.60	35.90	5.50	24.00	33.60	4.70	17.00	22.60	3.60

4.1 Higher Productivity Energy Scenario

In this scenario global demand for energy influenced by stronger economic growth is higher than in the most-likely case throughout the forecast period. Stronger demand for oil in the second part of the 1980s coupled with stable non-OPEC production helps OPEC to maintain a supply/demand balance (by controlling its overall quota), and to push prices to about US$20 per barrel, in nominal terms, by 1990. In the 1990s the gap between OPEC's potential (or desired) capacity and demand for OPEC oil gradually narrows, putting upward pressure on oil prices. However, the world oil price does not rise as dramatically as in the 1970s due to conservation efforts, inter-fuel substitution and technological changes already in place, leading to a decline in the industrial world's energy and oil intensity. During the second part of the 1990s, oil price pressure is expected to build due to the rising cost of delivering non-OPEC supplies, and real oil prices escalate at an average annual rate of about 7.5 percent. By the beginning of the next century unconventional oil supplies start to become a more significant factor, easing pressure on world oil supplies at a high though stable price. The real world oil price in the year 2000 is about US$32 and by 2010 about US$38.

The Canadian wholesale oil price fluctuates with the world oil price. In the long run, however, domestic crude oil prices would escalate more slowly than international prices as the Canadian dollar is projected to appreciate for the rest of the forecast period (from the current US$0.81 to US$0.83 by 2000 and US$0.84 by 2010). Canadian natural gas prices are expected to firm up in the short term and remain strong throughout the forecast period. In the second half of the 1990s, stronger demand from both markets combined with a decline in conventional deliverability and higher costs of crude oil puts upward pressure on natural gas prices. With continued deregulation in both the United States and Canada and free trade in energy between both countries, the increasing cost of marginal supplies in the United States drives up the price of gas in Canada. The real wholesale price of natural gas in central Canada averages $6/Mcf (in 1988$) in the year 2000 and $7.50 by 2010.

4.2 Deflation Energy Scenario

In this scenario, world oil demand remains persistently weak and world oil prices remain almost constant in real terms in the long run. For the next few years, OPEC has continuous problems with maintaining its overall production quota and nominal oil prices continue to hover around US$13-14 per barrel for the rest of the 1980s. Stronger pressure on oil prices occurs in the early 1990s in response to stronger economic growth and structural changes in the world oil market resulting from the period of low prices (which slows conservation and oil substitution, reduces non-OPEC production, etc). Most mega-projects are kept on hold, leaving the future demand for oil dependent on conventional supplies. However, conventional reserves are sufficient to meet slowly growing demand and prices remain constant in real terms for most of the 1990s. Reliance on conventional oil supplies (particularly from the Gulf region) would put pressure on oil prices again sometime after the year 2000. The real world oil price is around US$16 a barrel by 2000 and about US$17 by 2010.

Domestic oil prices move up gradually. Canadian natural gas prices hover around an 80 per cent ratio (on a BTU equivalence basis) throughout the forecast period.

4.3 Higher Inflation Energy Scenario

Stronger demand for oil enhanced by strong economic growth coupled with a successful balancing of supply and demand by OPEC put upward pressure on oil prices in the first half of the 1990s. The world oil price rebounds to reach US$29 per barrel in nominal terms by 1995. A new round of oil price reductions occurs in the subsequent period of weaker economic performance, increased energy efficiency and is enhanced by severe competition between OPEC and non-OPEC producers for shrinking markets. As a result, real oil prices are declining in the second half of the 1990s. The price slide slows down (hitting a low of US$15 per barrel, in 1988$, by 2000) when it approaches the cost of other competing energy forms. High interest rates, weak demand and relatively low oil prices delay many alternative projects. Conservation, interfuel substitution, a minor contribution from alternative fuels and general improvements in energy efficiency weaken again, causing the demand for oil to rise again and prices start escalating in real terms after 2000 to reach again US$21 (88$) by 2005 and US$24 by 2010.

Canadian oil and natural gas prices move in a similar pattern to international oil with adjustment for exchange rate trends and interfuel competition between these two fuels.

5.0 PROBABILITY RANKINGS

The probabilities in the table below are meant to rank the relative likelihoods of the scenarios. These probabilities are judgmental. They are derived from the forecasters' study of economic performance in different countries over different time periods, and from their opinions about the political pressures and economic philosophies which are likely to determine economic policies in the future. The probabilities were also influenced by the more formal empirical estimation of uncertainty undertaken for the preparation of the Prediction Ranges.

The four scenarios display, roughly, four possible combinations of economic characteristics: real GDP growth on the high side, with inflation on either the low or the high side (the "Higher Productivity" and "Most Likely" scenarios, respectively); and real GNP growth on the low side, again with inflation on either the low or the high side (the "Deflation" and "Higher inflation" scenarios, respectively). The probability stated for a scenario really refers to the indefinitely large family of scenarios whose members all display the same GDP/inflation characteristic. This is why the probabilities of the four scenarios sum to 100 per cent. The actual scenario forecast given may be considered to have the values which are most likely within that family.

The probability rankings are shown for two different possible uses of the scenarios. This recognizes the fact that the High inflation scenario's real growth rates are quite close to those in the Most Likely scenario. The High inflation scenario is primarily of interest for financial applications of the scenarios, and it may be desirable to ignore it in applications which focus primarily on real growth.

Financial Scenario Probabilities:

Years	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988-1995	30%	35%	15%	20%
1988-2025	30%	35%	20%	15%

Real Growth Scenario Probabilities:

Years	Higher Productivity	Most Likely	Deflation
1988-1995	30%	45%	20%
1988-2025	35%	40%	25%

The following table summarizes the average growth rates for Ontario of the two key economic variables in each of the four scenarios:

	Higher Productivity	Most Likely	Higher Inflation	Deflation
CPI, 1986-1995	3.4%	4.5%	6.5%	3.1%
CPI, 1986-2005	3.3	4.9	8.4	1.8
GDP,* 1986-1995	3.5	3.6	3.3	1.9
GDP,* 1986-2005	3.5	3.1	2.7	1.6

*Provincial Gross Domestic Product

ONTARIO

	Real Gross Domestic Product[1]				Labour Productivity			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	3.8	3.9	4.3	3.3	0.0	0.1	0.2	-0.2
1989	2.7	2.7	4.2	-0.9	0.0	0.1	0.7	-2.1
1990	1.0	2.3	1.5	-2.0	-0.4	0.4	0.2	-1.9
1991	2.7	3.5	3.0	1.5	1.6	2.0	0.7	2.5
1992	4.3	3.8	2.8	1.8	2.2	1.1	1.3	0.5
1986-1990	3.6	3.9	4.1	2.2	0.6	0.8	0.9	-0.1
1991-1995	3.3	3.3	2.4	1.5	2.0	1.7	1.1	1.7
1996-2000	3.8	2.8	2.1	1.0	2.4	1.9	0.8	1.2
2001-2005	3.4	2.4	2.3	1.5	2.4	1.5	1.1	1.9
2006-2010	3.2	2.1	2.0	1.2	2.3	1.6	0.8	1.6
2011-2025	2.8	1.7	1.5	1.0	2.0	1.7	0.8	1.4

	Consumer Price Index				Average Hourly Earnings - Manufacturing			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	4.0	4.5	5.0	3.7	4.7	4.5	5.5	4.6
1989	3.9	4.8	7.0	4.6	5.7	5.0	6.5	3.0
1990	3.6	4.6	6.5	3.0	5.0	5.0	7.0	1.3
1991	2.8	4.5	6.3	1.3	3.7	5.0	6.8	2.2
1992	3.1	4.5	7.0	2.2	4.6	5.0	7.5	2.5
1986-1990	4.1	4.6	5.5	4.1	4.5	4.5	5.4	3.4
1991-1995	3.0	4.5	7.5	2.1	4.6	5.8	8.4	2.8
1996-2000	3.0	5.0	10.0	-0.5	4.9	6.0	10.7	-0.4
2001-2005	3.0	5.5	10.4	1.3	5.6	7.0	11.0	1.3
2006-2010	3.0	5.0	10.0	1.5	5.1	7.0	10.5	2.4
2011-2025	3.0	5.0	10.0	1.5	5.1	6.5	10.5	2.5

1. Annual Average Percent Change
2. Percent

CANADA

	Real Gross Domestic Product[1]				Canadian Dollar			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	4.2	3.8	4.3	3.5	80.8	80.8	78.8	80.5
1989	2.3	2.5	4.2	-0.1	82.2	80.0	77.0	77.5
1990	1.5	2.1	1.8	-1.5	81.5	79.0	76.0	73.5
1991	3.0	3.2	3.1	1.5	80.0	78.0	72.5	73.0
1992	3.9	3.4	3.1	2.5	81.0	78.0	72.0	71.0
1986-1990	3.1	3.1	3.5	1.8	78.4	77.4	75.8	75.8
1991-1995	3.7	3.2	2.8	1.8	81.6	79.0	73.0	71.4
1996-2000	3.8	2.6	2.0	0.8	83.2	80.0	72.0	70.0
2001-2005	4.0	2.6	2.3	1.5	84.0	78.0	71.5	71.0
2006-2010	3.5	2.1	2.0	1.0	84.0	77.0	69.0	72.0
2011-2025	3.0	1.7	1.5	0.8	84.0	75.0	65.0	70.0

	Prime Rate[2]				Canadian Government Long Term Bonds[2]			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	10.2	10.7	10.7	10.1	10.5	10.3	11.0	10.4
1989	11.5	11.4	13.0	9.6	10.7	10.5	13.0	10.3
1990	10.0	9.5	11.6	7.5	9.7	9.0	11.5	7.8
1991	8.0	9.0	11.0	6.1	8.5	9.1	10.5	6.3
1992	8.0	9.5	11.6	5.9	8.3	9.5	12.0	6.5
1986-1990	10.4	10.3	11.1	9.5	10.1	9.9	11.0	9.6
1991-1995	7.5	9.0	12.0	5.8	7.7	9.2	12.6	6.2
1996-2000	7.5	9.0	13.0	3.9	7.6	9.5	13.5	4.5
2001-2005	7.0	9.0	13.5	4.0	7.5	9.5	15.0	4.1
2006-2010	7.0	8.5	13.0	4.0	7.0	9.0	13.5	4.5
2011-2025	7.0	8.0	12.0	4.0	7.0	8.5	13.0	4.5

1. Annual Average Percent Change
2. Percent

September 1988

UNITED STATES

	Real Gross National Product[1]				Consumer Price Index[1]			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	3.9	3.5	4.4	3.9	4.3	4.1	4.4	4.3
1989	1.5	2.5	4.1	-0.4	4.8	4.9	6.5	4.5
1990	1.0	1.8	-0.7	-0.7	3.7	4.4	6.6	2.7
1991	3.0	3.0	3.0	3.0	2.9	3.9	5.3	1.1
1992	3.5	2.7	3.7	2.4	3.1	4.5	5.9	1.9
1986-1990	2.4	2.7	2.7	1.7	3.7	3.8	4.6	3.4
1991-1995	3.5	2.6	2.4	2.3	3.3	4.4	6.4	1.7
1996-2000	3.5	2.5	2.3	1.1	3.2	5.0	9.8	-0.9
2001-2005	3.5	2.5	2.5	1.6	3.0	5.0	10.5	0.8
2006-2010	3.5	2.3	2.3	1.0	3.0	5.0	9.5	1.0
2011-2025	3.5	2.0	2.0	1.0	3.0	5.0	9.0	1.0

	Prime Rate[2]				Government Long Term Bonds[2]			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	9.5	9.3	9.3	9.3	9.2	9.2	9.5	9.3
1989	10.4	10.1	11.8	9.3	9.4	9.5	11.6	8.9
1990	8.7	8.4	10.4	7.2	8.3	8.0	10.6	7.3
1991	6.9	7.9	8.5	5.7	7.1	8.1	9.4	6.1
1992	7.0	8.3	9.5	5.6	7.0	8.5	9.9	6.1
1986-1990	9.0	8.9	9.6	8.5	8.7	8.7	9.7	8.5
1991-1995	7.0	8.4	9.8	5.5	7.0	8.5	10.4	5.8
1996-2000	6.7	8.5	12.0	3.8	6.7	8.5	13.3	4.1
2001-2005	6.5	8.0	13.0	3.5	6.5	8.2	14.5	3.6
2006-2010	6.5	7.8	12.0	3.5	6.5	8.0	13.0	3.5
2011-2025	6.5	7.5	11.5	3.5	6.5	7.5	12.5	3.5

1. Annual Average Percent Change
2. Percent

September 1988

REAL ENERGY PRICES[1]

	International Crude Oil Price[2] F.O.B. Saudi Arabia Light				Domestic Crude Oil - ORAC[3]			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	-12.2	-16.2	-16.5	-22.0	-16.2	-17.1	-14.3	-22.0
1989	7.5	9.3	-6.1	-6.0	12.1	7.9	-4.4	-5.4
1990	7.2	4.4	12.6	-2.6	5.8	5.8	12.2	4.0
1991	4.0	1.4	4.0	4.5	2.5	1.4	4.2	4.6
1992	4.0	2.0	4.0	4.5	1.5	1.0	3.3	6.7
1991-1995	4.0	2.5	4.0	1.8	2.6	1.0	3.2	1.8
1996-2000	7.5	4.2	-5.0	2.4	6.7	4.7	-4.8	1.0
2001-2005	1.5	2.4	7.0	1.6	1.2	2.0	6.5	0.5
2006-2010	2.0	0.0	3.0	0.0	2.0	0.5	3.0	-0.4
2011-2025	0.0	0.0	1.4	2.1	0.0	0.0	0.8	1.6

	Natural Gas Prices - Toronto City Gate[4]			
	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	-10.5	-13.4	-11.5	-16.9
1989	10.7	2.5	-7.5	-1.4
1990	4.4	3.9	10.9	1.1
1991	0.7	3.1	3.0	3.5
1992	0.4	0.5	2.1	5.5
1991-1995	1.3	1.5	1.7	1.0
1996-2000	7.4	4.8	-3.6	1.0
2001-2005	1.7	2.0	5.7	0.5
2006-2010	2.0	0.5	2.7	-0.4
2011-2025	0.0	0.0	0.8	1.6

Notes:
1. Annual Average Percent Change, Constant 1988 dollars
2. Actual Price for 1987 was US$17.20 per barrel
3. Ontario Refiners Acquisition Cost - Actual Price for 1987 was Cdn$24.25 per barrel
4. Toronto City Gate - Average wholesale price of Toronto Actual Price for 1987 was Cdn$3.70 per Mcf

September 1988

ONTARIO HYDRO INTEREST RATES[1]

	Intermediate Rates in Canada				Long Rates in Canada			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	10.5	10.0	10.9	10.3	10.9	10.7	11.4	10.8
1989	10.7	10.3	13.0	10.6	11.1	10.9	13.5	10.8
1990	9.6	8.9	11.5	7.6	10.1	9.6	12.0	8.0
1991	8.8	9.1	10.5	6.4	9.1	9.7	11.0	6.8
1992	8.3	9.5	12.0	6.4	8.6	10.1	12.5	6.8
1986-1990	10.2	9.7	11.0	9.4	10.7	10.3	11.5	9.9
1991-1995	7.7	9.5	12.6	5.8	8.2	9.8	13.0	6.1
1996-2000	7.6	9.5	13.5	4.4	8.1	10.0	13.9	4.6
2001-2005	7.5	9.5	15.0	4.2	8.0	10.0	15.3	4.4
2006-2010	7.0	9.0	13.5	4.5	7.5	9.5	14.0	4.8
2011-2025	7.0	8.5	12.0	4.5	7.5	9.0	12.5	4.8

	Intermediate Rates in USA				Long Rates in USA			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	9.3	9.2	9.6	9.3	10.0	10.0	10.4	10.1
1989	9.7	9.6	11.8	9.0	10.3	10.3	12.3	9.4
1990	8.3	8.1	10.8	7.4	8.9	8.8	11.2	7.8
1991	7.2	8.3	9.6	6.2	7.7	8.9	10.0	6.6
1992	7.0	8.7	10.0	6.2	7.5	9.3	10.4	6.6
1986-1990	8.9	8.8	9.9	8.6	9.5	9.5	10.5	9.1
1991-1995	7.1	8.5	10.5	5.9	7.6	9.1	10.9	6.3
1996-2000	6.7	8.5	13.3	4.2	7.2	9.0	13.7	4.6
2001-2005	6.5	8.2	14.5	3.7	7.0	8.7	15.0	4.1
2006-2010	6.5	8.0	13.1	3.6	7.0	8.5	13.5	4.0
2011-2025	6.5	7.5	12.6	3.6	7.0	8.0	13.0	4.0

1. Percent

FOREIGN EXCHANGE SCENARIOS

CDN$/CURRENCY

	Deutschemark				Swiss Franc			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	0.698	0.700	0.716	0.701	0.837	0.839	0.850	0.841
1989	0.660	0.671	0.750	0.693	0.797	0.802	0.900	0.832
1990	0.725	0.723	0.800	0.770	0.867	0.861	0.960	0.920
1991	0.750	0.754	0.872	0.788	0.892	0.897	1.050	0.948
1992	0.740	0.777	0.904	0.806	0.883	0.916	1.085	0.965
1986-1990	0.689	0.691	0.725	0.705	0.828	0.828	0.870	0.846
1991-1995	0.750	0.763	0.975	0.807	0.896	0.893	1.132	0.958
1996-2000	0.763	0.816	1.235	0.750	0.894	0.954	1.399	0.880
2001-2005	0.732	0.869	1.520	0.628	0.871	1.013	1.741	0.741
2006-2010	0.696	0.926	1.843	0.554	0.818	1.085	2.126	0.654
2011-2025	0.637	1.092	2.445	0.480	0.749	1.278	2.843	0.567

	100 Japanese Yen				United Kingdom Pound			
	Higher Productivity	Most Likely	Higher Inflation	Deflation	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	0.952	0.960	0.975	0.956	2.200	2.210	2.250	2.210
1989	0.890	0.929	1.000	0.950	2.000	2.130	2.300	2.190
1990	0.925	0.974	1.025	0.970	2.050	2.090	2.300	2.100
1991	0.925	0.986	1.039	0.975	1.950	2.050	2.350	2.040
1992	0.900	0.986	1.072	0.983	1.880	2.050	2.350	2.060
1986-1990	0.897	0.916	0.943	0.919	2.093	2.129	2.213	2.143
1991-1995	0.895	0.969	1.115	0.943	1.830	2.015	2.380	1.960
1996-2000	0.850	1.041	1.365	0.833	1.680	2.025	2.850	1.700
2001-2005	0.800	1.091	1.683	0.694	1.560	2.104	3.520	1.410
2006-2010	0.740	1.133	2.039	0.607	1.450	2.132	4.280	1.240
2011-2025	0.660	1.230	2.694	0.521	1.270	2.191	5.570	1.060

Figures shown are the average value for the period.

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CONSTRUCTION COST INDICES: COMPOSITE INDICES

	Nuclear Generating Stations			
	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	4.4	5.6	5.1	4.3
1989	4.9	5.3	6.1	3.4
1990	4.7	5.2	6.4	1.9
1991	4.0	5.1	6.0	2.9
1992	4.7	5.3	6.8	3.3
1991-1995	4.8	5.3	7.1	3.0
1996-2000	4.9	6.2	8.8	2.0
2001-2005	5.0	6.5	11.0	1.0
2006-2010	4.5	6.4	10.2	2.0
2011-2025	4.5	6.0	10.2	2.0

	Hydraulic Generating Stations			
	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	4.1	5.6	4.5	3.9
1989	4.8	5.5	6.3	3.1
1990	4.6	5.3	6.6	1.4
1991	4.0	5.3	6.1	2.8
1992	4.7	5.5	7.0	3.1
1991-1995	4.0	5.3	7.3	3.0
1996-2000	4.9	6.2	8.8	1.7
2001-2005	4.9	6.5	11.0	1.0
2006-2010	4.4	6.4	10.2	2.0
2011-2025	4.4	6.0	10.2	2.0

	Fossil Generating Stations			
	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	3.7	4.8	4.9	3.4
1989	4.6	5.3	6.2	3.3
1990	4.5	5.4	6.5	1.4
1991	4.2	5.5	6.2	3.0
1992	4.9	5.7	7.0	3.4
1991-1995	4.7	5.4	7.4	3.2
1996-2000	4.9	6.3	9.2	2.5
2001-2005	4.8	6.4	11.0	0.8
2006-2010	4.3	6.2	10.3	1.5
2011-2025	4.3	5.9	10.3	1.5

CONSTRUCTION COST INDICES: COMPOSITE INDICES (continued)

	Transmission Systems			
	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	4.5	4.7	5.3	4.2
1989	4.7	4.4	6.4	2.8
1990	4.3	4.6	6.5	0.6
1991	3.5	4.7	6.1	2.1
1992	4.3	4.9	6.9	2.5
1991-1995	4.3	4.9	7.3	2.4
1996-2000	4.5	5.8	9.5	0.8
2001-2005	4.9	6.4	11.0	0.9
2006-2010	4.4	6.3	10.2	2.0
2011-2025	4.4	6.0	10.2	2.0

	Regions			
	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	3.3	3.2	4.6	2.8
1989	3.9	3.8	6.6	2.0
1990	3.6	4.6	6.9	-1.2
1991	3.0	4.7	5.9	1.3
1992	4.0	5.1	7.3	1.9
1991-1995	3.8	4.8	7.3	1.7
1996-2000	3.9	6.0	9.4	0.6
2001-2005	4.4	6.1	11.0	0.6
2006-2010	3.9	5.9	10.2	2.0
2011-2025	3.9	5.6	10.2	2.0

OPERATION, MAINTENANCE AND ADMINISTRATION INDICES

	Ontario Hydro - Labour			
	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	4.7	4.0	4.7	3.6
1989	5.7	4.0	6.0	3.0
1990	5.0	4.5	6.1	1.3
1991	3.7	4.5	5.6	2.2
1992	4.6	4.5	6.2	2.5
1991-1995	4.6	4.8	6.5	2.2
1996-2000	4.9	5.5	7.5	-0.4
2001-2005	5.6	7.0	11.0	1.3
2006-2010	5.1	7.0	10.0	2.9
2011-2025	5.1	6.5	10.0	2.9

	Ontario Hydro - Material			
	Higher Productivity	Most Likely	Higher Inflation	Deflation
1988	3.9	3.7	5.5	3.6
1989	4.2	3.8	6.5	2.4
1990	3.8	3.9	7.0	0.6
1991	3.1	4.0	6.8	1.7
1992	3.6	4.1	7.5	2.1
1991-1995	3.8	4.0	7.7	1.9
1996-2000	4.0	4.6	10.7	2.2
2001-2005	4.5	5.5	11.0	0.5
2006-2010	4.0	5.4	10.5	1.6
2011-2025	4.0	5.1	10.5	1.6

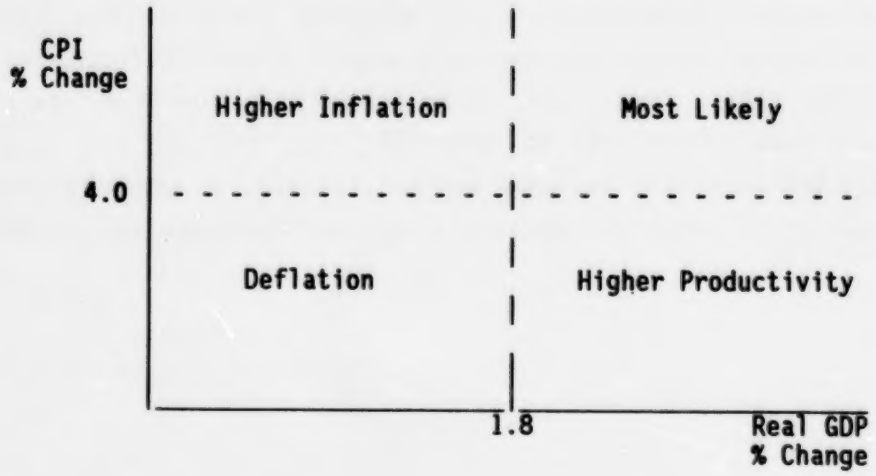
* Please refer to Cost Escalators for more detailed information.

APPENDIX: STATISTICAL CONCEPTS ASSOCIATED WITH THE SCENARIOS

The scenarios focus on two key long-term planning variables, real GDP growth and inflation. Once these two are known, they provide a basis for predicting consistent values of other variables such as interest rates and oil prices (although, especially in the case of oil prices, there is some uncertainty as to what should be the precise relation with other economic variables). The user will note that there are four different combinations of inflation and GDP growth displayed in the four scenarios. The most likely scenario presents relatively high growth with moderate inflation, while the others provide alternative combinations of these variables, as shown in the chart below.

Chart I

GDP and CPI Combinations
Represented by the Scenarios
(Forty Year Averages)



The inflation rate and real GDP growth rates on the axes of the graph refer to the average value for the forty year period covered by the scenarios. There is an implicit third dimension to the chart, which would map the probabilities of the individual CPI-GDP combinations. The probability assigned to a scenario actually refers to the probability of all of the combinations of GDP and CPI in the quadrant to which it belongs. For example, the probability stated for the Deflation Scenario is the probability of all combinations in which GDP growth averages less than 1.8% and CPI inflation averages less than 4%. These

probabilities are developed judgmentally. They are based on the past experience of the fluctuations of these variables and on theoretic judgments of their potential combinations. (Consequently, they are meant to be consistent with the probabilities implied by the Prediction Ranges document which has been used for picking the boundaries in Chart I). The series of numbers produced for each scenario corresponds notionally to the statistical expected value from all the possible combinations in its quadrant in Chart I.

The large number of GDP-CPI combinations shown in Chart I may appear perplexing at first sight. Conventional wisdom usually associates high real GDP growth with high inflation. In reality, however, this combination of events is found in a short-term transitional situation, in which the rate of change of GDP is itself changing due to economic stimulation. The combinations depicted in Chart I for the scenarios represent long-term averages, and all combinations are theoretically possible. High GDP growth which is due to high productivity growth (and so does not represent an acceleration of demand beyond the capacity of the economy to produce) is not inflationary, as the experience of the 1950s and 1960s demonstrated. Conversely, high inflation, once it has gained momentum, can continue in spite of stagnating economic growth, as indicated by the experience of the 1970s. This condition is described by the term "stagflation". While all combinations may be possible, they are not all equally likely. Probabilities have been assigned to the scenarios in order to enable the user to gauge their relative importance as contingencies for planning purposes.